

Initial FFM Data Analysis

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Goals

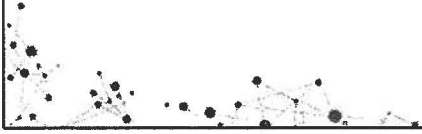
- Debrief ongoing data analysis activities and initial observations
- Outline next steps and recommendations



Application/Infrastructure Performance

Current Data Analysis Activities

- **Actors:** CGI OPS team, CMS Engineers, Terremark/URS
- **Activities:** Constant monitoring of application and infrastructure performance, bottlenecks, load, and overall system well-being
- **Observations To-Date:**
 - Issues observed with Tomcat and SOA-P server configurations (e.g., U-limits, session limits, etc.) that have been tuned based on day-to-day observations
 - Thread-dumps/analysis for specific sessions/applications where known issues have arise (e.g., network timeouts) have not revealed any "smoking guns"
 - Additional tooling/monitoring is being brought in to analyze threads/memory utilization/etc. to "dig deeper"
 - Specific application issues that have been found (e.g., long running queries, slow performing services) are being addressed as they are found and included in the next available Production builds once tested and verified
- **Challenges:**
 - More broadly available and instrumented monitoring tools are needed to assist with proactive troubleshooting (e.g., Splunk, JON)



Application/Infrastructure Performance Remediation Plans and Recommendations

• Plans

- Continue active monitoring of environment and proactively/reactively adjust tuning as needed
- Troubleshoot in lower environments with less infrastructure complexity to identify any specific infrastructure tuning or application-specific issues (e.g., memory leaks, poor performing code) that may be contributing to performance observations in PROD
- Seeking additional monitoring tools that can be used in lower environments to support the above analysis
- Focus on long-running queries and slow performing services to tune those in the lower environment and promote updates to PROD
- Continue reactive monitoring (e.g., thread dumps) when known, specific, and targeted issues occur (e.g., a known application or session) to spot issues as they are happening

• Recommendations

- Accelerate additional instrumentation of monitoring tools in PROD (e.g., Splunk, JON) to facilitate better proactive analysis

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In-Progress Applications

Current Data Analysis Activities

- **Actors:** CGI BA/DEV teams
- **Activities:**
 - Reviewing data extracts and application activity to find where applications are stalling (e.g., last card reached) to drive further analysis as to whether this is expected "social behavior" or whether there are issues/errors occurring in these areas that are preventing users from proceeding forward
- **Observations To-Date:**
 - Majority of applications are stalling at the following screens
 - **Review, Sign, and Submit** (~26% of all applications) – Known issues with UI not refreshing when eligibility results are determined. If user logs back in, they will be correctly directed to Plan Compare. Also known that ~21% of these have issues proceed to Plan Compare (see next slide)
 - **Failed ID Proofing** (~23% of all In-progress application) – Users who are not ID Proofed cannot submit their application. Issues with EIDM may have prevented users from legitimately stepping up to LOA2
 - **Delayed Response** (~6% of all In-progress applications) – Applications that could not connect to TDS require users to go back through the application when the TDSs are available in order to submit
 - **FAH Immigration** (~5% of all in progress applications) – This screen collects Immigration documents/IDs for U.S. Nationals. Users may be paused to collect this information. There are no known issues in the application that are preventing users from moving forward
- **Challenges:**
 - Too early to determine whether the card numbers represent expected behavior in the system or system problems. As issues arise in certain areas of the system, we are cross-referencing the card counts to see whether fixing the issue would clear a log-jam in the application for that known population of applications.

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In-Progress Applications Remediation Plans and Recommendations

• Plans

- Continue active monitoring of application progress through the system and identify new/existing areas to target where applications seem to be stalling
- Address known system issues as they arise quickly that deal with user experience on screens or issues in which the user is blocked by errors to remove log-jams
 - Fixes to support UI issues on Review, Sign, and Submit are included in the 7.0.1.5 release
 - Fixes to support UI/Back-end issues with verifying lawful presence and multiple relationship records are targeted for the 7.0.1.6 release
- Leverage data analysis from submitted applications to find issues earlier in the application process and address them before the user submits their application
- Writing "batch jobs" to clean up data where there are known issues and that will not affect user's entered data (e.g., deleting duplicate relationships) – targeting end of next week (10/19) for these to be written and thoroughly tested for execution in Production

• Recommendations

- CGI/CMS with Call Center to ensure they are capturing the application IDs and/or the screens where users are experiencing system problems to help correlate card counts with system issues (vs. lack of understanding of what to do on the card or voluntary abandonment)
- CGI./CMS to work together to strategies for addressing applications that need "clean-up" once the code fixes are put in place to prevent further propagation of the issue

Submitted Application and Eligibility Results

Current Data Analysis Activities

- **Actors:** CGI BA/DEV teams, CCIO SMEs
- **Activities:**
 - Continued scenario testing in both Production (as applicable) and in lower environments to observe how the system is behaving in specific use cases (e.g., application flow/logic, back-end data collection and results)
 - Proactive data collection from Production to review trends and anomalies in data to find areas where verification/eligibility events and/or eligibility results appear incorrect and the patterns therein
 - Reactive data analysis for known applications and/or user experiences where known errors occurred to "deep dive" into that specific user experience
- **Observations To-Date:**
 - A large number of FA applications are missing verification/eligibility events which is contributing to incorrect eligibility determinations (currently just under 50% of FA applications). Continued analysis is needed to determine what % of those applications did not get a correct determination as a result.
 - Issues in the code for applications without SSNs and for users who are doing multiple edits in the FAH section which is causing duplicate family relationship "records" are causing errors when transferring the application to Plan Compare (currently around 23% of all applications)
- **Challenges:**
 - More broadly available and instrumented logging aggregation tools (e.g., Splunk) are needed to assist with proactive troubleshooting to determine if there are errors in the server logs related to the missing verification events or whether the issue lies in the implemented business rules

Submitted Application and Eligibility Results Remediation Plans and Recommendations

• Plans

- Continue active monitoring by CGI/CMS of submitted applications to spot existing and new trends
 - Includes continuing to tweak data queries to show results in a format that are easily aggregated and analyzed
- Continue to address known system issues as they arise that deal with incorrect application logic or data/system anomalies
 - Several fixes have already been made to Production to "stop the bleeding"
- CGI/CMS has already begun to separate data issues in to ones that can be fixed with a behind-the-scenes data clean-up and ones that require more individualized attention (e.g., calling the consumer and walking them back through the application)
 - This activity will be ongoing as new issues/patterns emerge
- Leverage data analysis from un-submitted applications to uncover areas that will need clean-up in submitted applications

• Recommendations

- CGI/CMS to have a review board to agree on which issues can (technically) and should (politically/practically) be solved with back-end batch jobs to correct data to ensure effective use of resources and time
 - E.g., some issues would be resolved simply by having the user log back into the system and do not require data clean-up but may require an outreach strategy instead

Enrollments

Current Data Analysis Activities

- **Actors:** CGI BA/DEV teams, CCLIO SMEs, Issuers
- **Activities:**
 - Daily calls with Issuers to review any anomalies with 834s (counts of initial enrollments vs. cancels, data issues, etc.)
 - Active monitoring of policy generation by CGI DEV SMEs and reconciliation with QSSI HUB 834 generation
- **Observations To-Date:**
 - A number of applications are showing multiple initial/cancel events in quick succession. It appears users are able to click "submit" multiple times which is creating an initial policy and then immediately auto-canceling and creating a new policy.
 - Issues initially observed with sending cancellation 834 XMLs which resulted in issuers only receiving the Initial 834s, not the intermediate Cancels
 - Policy records are not being created for applications in which the applicants seeking coverage did not provide an SSN
 - Many issuers are indicating they are not able to process Cancel 834s despite their conformance with the Companion Guide
 - Low numbers of enrollments compared to submitted applications
- **Challenges:**
 - Unable to determine at this time whether low enrollment counts are attributable to system issues or due to users choosing not to select/enroll in a plan

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Enrollments

Remediation Plans and Recommendations

- **Plans**

- Continue active monitoring by CGI/CMS/QSSI/Issuers of submitted enrollments to spot existing and new trends
- Continue to address known system issues as they arise that deal with incorrect application logic or data/system anomalies
 - Several fixes have already been made to Production to "stop the bleeding" such as fixes to properly sending the cancellation 834 XM and updates to move the Subscribing member to be the first member in the list
 - Other fixes are included in the 7.0.1.5 release (e.g., to address policy creation for applicants without SSNs; updates to transaction logger to provide better insight into 834 activities/issues)
- Continue to monitor Application and Plan Compare issues that may be affecting Enrollment, such as unexpected data or blocking issues preventing users from getting through to the enrollment process

- **Recommendations**

- CGI/CMS to have a review board to agree on which issues can (technically) and should (politically/practically) be solved with back-end batch jobs to correct data to ensure effective use of resources and time
 - E.g., some issues can be resolved by regenerating the 834 transactions. Some issuers have said their system cannot handle this, so more nuanced and/or brute force methods may be necessary